

Effect of Treatment Methods on Used Lubricating Oil for Recycling Purposes

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Abstract

The need to treat used lubricating oil for possible reuse has arisen due to concern for the environment, scarcity, price stability, and increasing dependence on this product for many industrial applications. Various methods, such as distillation/clay, acid/clay, acid, and activated charcoal/clay treatment methods, were employed in this study for the treatment of used Mobil and Total lubricating oil samples with the aim of improving their qualities for reuse. The characteristics of the fresh, used, and treated oil are tested for water content, specific gravity, kinematic viscosity, viscosity index, flash point, pour point, sulphur content, and concentrations of heavy metals (aluminum, iron, and lead). The results obtained showed that the usage of the lubricant oil affects the qualities of oil, for instance the sulphur of both brands of the oil samples was below the detectable limit, while the sulphur contents of the used oil are 0.80 and 0.69% for the used Mobil and Total oil samples, respectively. The results also revealed that treatments employed in this work were able to improve the characteristics of the used oil samples after treatment. The analyses of the results showed that the acid/clay method was the most effective method of treatment that brings the characteristics of the treated oil close to the fresh oil sample, while the distillation/clay and activated/charcoal methods were the best in terms of recovery of the oil after treatment. These two methods also recovered about 80% of the used lube oil samples compared to acid and acid/clay treatment methods, where the oil recovered was about 50% of the charge used oil sample.

Keywords:: [characteristic of oil](#), [lubricating oil](#), [treatment methods](#), [used oil and treated oil](#)

